

Claims:

1. A method of forming a rainbow security hologram of an object having different colors assigned at different locations on the object , said method comprising the step of forming different parts of the object with different grating values, wherein the grating value at a particular location determines the color assigned to said location.
2. A method of forming a rainbow security hologram of an object having different colors assigned at different locations, said method comprising the steps of
 - a. splitting a coherent light into a reference beam and one object beam;
 - b. directing the reference beam and the object beam along separate paths such that the reference beam and the object beam interferes on a photo sensitive material on which the hologram is to be formed; and
 - c. essentially directing the reference beam directly on the photo sensitive material and the object beam to pass through a Slit Master Hologram (SMH) recording plate having the object formed on it wherein different parts of the object are formed by different grating values on the SMH, before the same interferes with the reference beam on the photo sensitive material.
3. A method as claimed in claim 2 wherein in step (a), the coherent light is a laser beam.
4. A method as claimed in claim 2 wherein in step (a), wherein laser beam is generated by a He-Ne laser or a high intensity laser diode.
5. A method as claimed in claim 2 wherein in step (a), the laser beam is split into a reference beam & an object beam by a variable beam splitter.
6. A method as claimed in claim 1, wherein in step (b), the reference beam and the object beam are directed along separate paths using plurality of reflecting surfaces.
7. A method as claimed in claim 6, wherein the reference beam and the object beam are directed along separate paths using at least two reflecting surfaces.

8. A method as claimed in claim 6, wherein the reflecting surfaces are complete or partial reflecting surfaces.
9. A method as claimed in claim 6, wherein the reflecting surfaces are plane reflecting mirrors.
10. A method as claimed in claim 2, wherein the reference beam and the object beam individually are optionally are allowed to pass through a beam expander and collimating lens before interfering on the photo sensitive material.
11. A method as claimed in claim 2, wherein the grating value at a particular location of the object formed on SMH determines the color assigned to said location of the object when formed on photo sensitive material.
12. A method as claimed in claim 1 wherein in step (c), slit master hologram recording plate (SMH) has different grating value for different wavelength.
13. A method as claimed in claim 12, wherein the grating value for a particular wavelength of light at a predetermined angle of illumination and angle of view is give by the formula $d = \lambda / (\sin \theta_i + \sin \theta_v)$ wherein θ_v = angle of view , θ_i = angle of illumination, d is grating value and λ is wavelength of light.
14. A method of authenticating /verifying a color assigned rainbow security hologram imposed with an image of an object, wherein different locations of the object have different pre assigned colors using which an authenticating hologram is prepared, said method comprising the steps of
 - a. obtaining a reference beam;
 - b. projecting the reference beam through a Slit Master Hologram (SMH) to obtain a decoding reference beam,
 - c. projecting the decoding beam on to the hologram which is to be authenticated such that an image of the object is formed, and
 - d. verifying the image thus formed using a photo detector to authenticate the hologram.

15. A method of authenticating / verifying as claimed in claim 14, wherein in step (a), the reference beam is obtaining from source of He-Ne laser or high intensity laser diode.
16. A method of authenticating /verifying as claimed in claim 14 wherein in step (b), the reference beam is allowed to pass through a beam expander and a collimating lens before passing through Slit Master Hologram (SMH).
17. A method of authenticating /verifying as claimed in claim 14 wherein in step (b), slit master hologram recording plate (SMH) has different grating value for different wavelength.
18. A method of authenticating / verifying as claimed in claim 14 wherein in step (c), verification includes analyzing the of the image formed and authenticating the hologram if the colors of various parts of the images formed are in a pre assigned format.
19. A method of authenticating / verifying as claimed in claim 14 wherein in step (c), verification includes the steps of
 - a) analyzing the colors of various parts of the image.
 - b) matching the colors of various parts of the image with a pre assigned format.
 - c) verifying the hologram to be authenticate if the colors of various parts of the image are in the pre assigned format.
20. A method of authenticating /verifying as claimed in claim 14 wherein in step (d), the photo detector is placed at the position where reconstructed image of the object is formed.
21. A method of authenticating /verifying as claimed in claim 14 wherein in step (d), the photo detector is used in conjunction with a threshold circuit for verifying the image formed.
22. A method of authenticating /verifying as claimed in claim 14, is used for machine inspection in addition to visual inspection for color assigned security hologram.